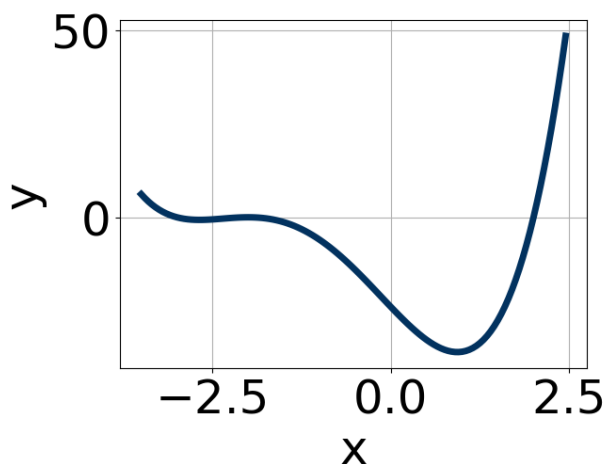1. Which of the following equations *could* be of the graph presented below?

   A. $19(x + 2)^7(x - 2)^4(x + 3)^9$

   B. $20(x + 2)^{10}(x - 2)^8(x + 3)^7$

   C. $13(x + 2)^4(x - 2)^{11}(x + 3)^{11}$

   D. $-18(x + 2)^4(x - 2)^7(x + 3)^4$
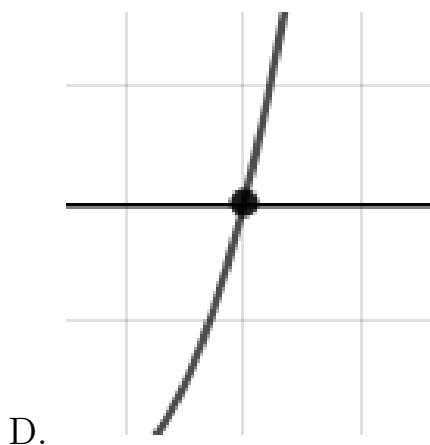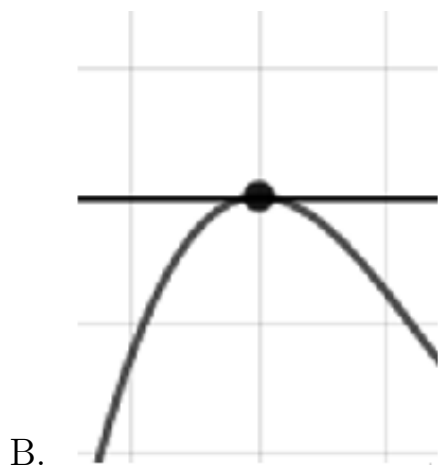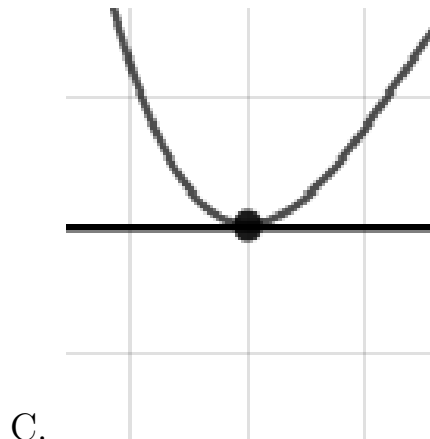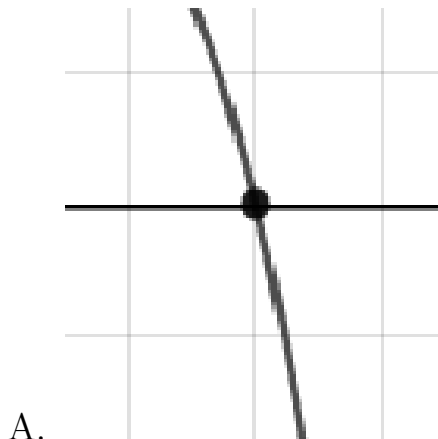
   E. $-4(x + 2)^{10}(x - 2)^{11}(x + 3)^5$

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2. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{1}{4}, \frac{7}{5}, \text{ and } 2$$

   A. $a \in [17, 26], b \in [68, 75], c \in [69, 74], \text{ and } d \in [10, 16]$

   B. $a \in [17, 26], b \in [-7, -6], c \in [-59, -56], \text{ and } d \in [-18, -13]$

   C. $a \in [17, 26], b \in [-73, -66], c \in [69, 74], \text{ and } d \in [-18, -13]$

   D. $a \in [17, 26], b \in [-73, -66], c \in [69, 74], \text{ and } d \in [10, 16]$

   E. $a \in [17, 26], b \in [-66, -58], c \in [34, 45], \text{ and } d \in [10, 16]$

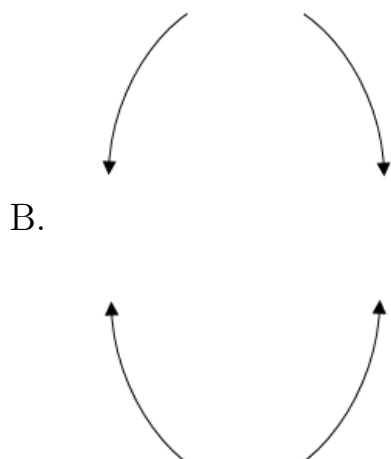3. Describe the zero behavior of the zero $x = 2$ of the polynomial below.

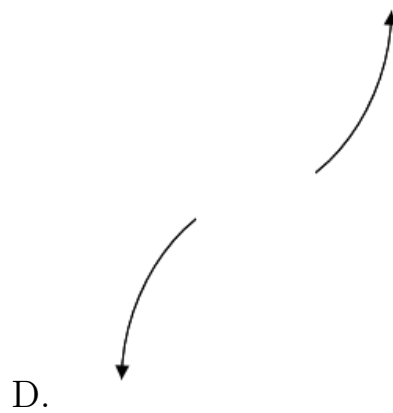$$f(x) = -9(x - 7)^7(x + 7)^4(x - 2)^{12}(x + 2)^9$$

A.

C.

B.

D.

E. None of the above.

4. Describe the end behavior of the polynomial below.

$$f(x) = 8(x - 9)^2(x + 9)^5(x - 7)^4(x + 7)^6$$
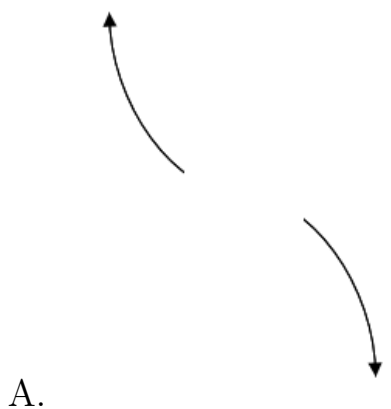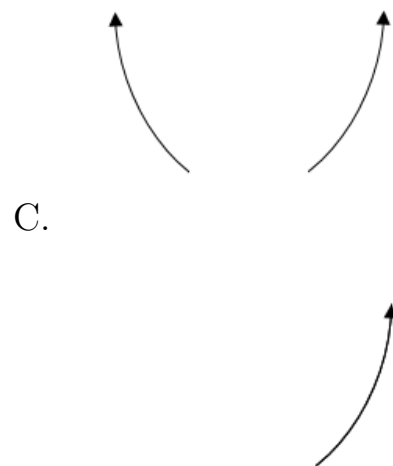
A.

B.

D.

C.

E. None of the above.

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5. Describe the end behavior of the polynomial below.

$$f(x) = 9(x+5)^3(x-5)^6(x-3)^5(x+3)^7$$

C.

A.

B.   D.

E. None of the above.

6. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-2 + 5i \text{ and } 3$$

A. $b \in [-0.1, 2.4], c \in [15, 24], \text{ and } d \in [-94, -80]$

B. $b \in [-2.5, -0.9], c \in [15, 24], \text{ and } d \in [75, 89]$

C. $b \in [-0.1, 2.4], c \in [-8, -3], \text{ and } d \in [10, 24]$

D. $b \in [-0.1, 2.4], c \in [-2, 5], \text{ and } d \in [-10, -2]$

E. None of the above.

7. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{-3}{2}, \frac{-7}{3}, \text{ and } -4$$

A. $a \in [1, 13], b \in [42, 51], c \in [111, 117], \text{ and } d \in [-87, -83]$

B. $a \in [1, 13], b \in [-4, 2], c \in [-76, -68], \text{ and } d \in [84, 88]$

C. $a \in [1, 13], b \in [-50, -41], c \in [111, 117], \text{ and } d \in [-87, -83]$

D. $a \in [1, 13], b \in [42, 51], c \in [111, 117], \text{ and } d \in [84, 88]$

E. $a \in [1, 13], b \in [28, 30], c \in [-3, 5], \text{ and } d \in [-87, -83]$

8. Which of the following equations *could* be of the graph presented below?
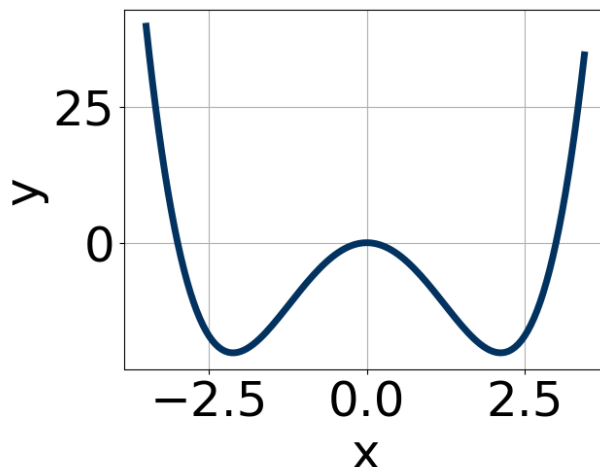
A. $18x^8(x+3)^9(x-3)^7$

B. $-19x^4(x+3)^5(x-3)^4$

C. $19x^4(x+3)^8(x-3)^{11}$
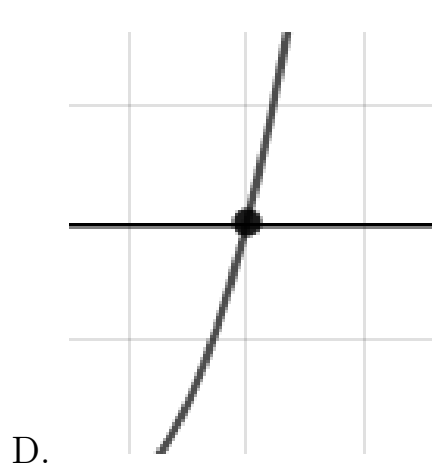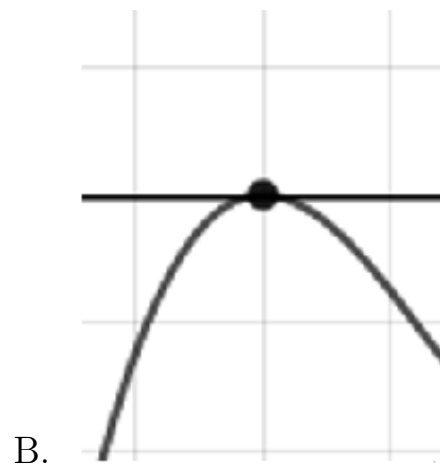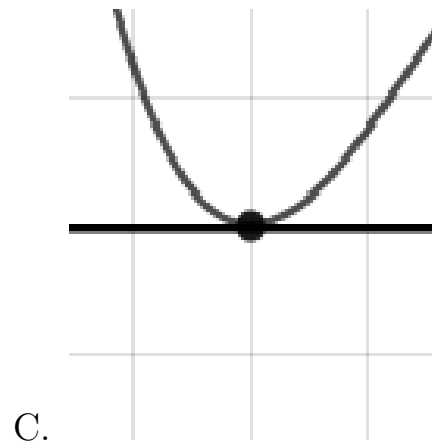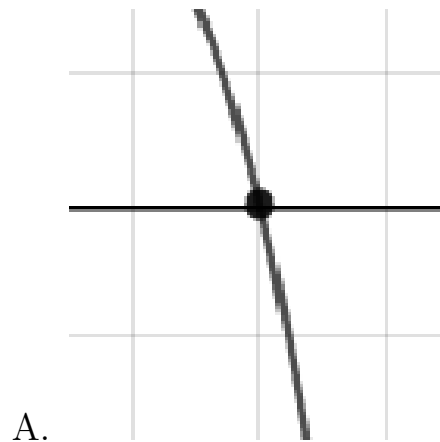
D. $8x^5(x+3)^8(x-3)^7$

E. $-3x^4(x+3)^{11}(x-3)^7$

9. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$5 + 2i \text{ and } 4$$

A. $b \in [-6, 2], c \in [-9.4, -7.5], \text{ and } d \in [18, 22]$

B. $b \in [-21, -8], c \in [67.5, 70.9], \text{ and } d \in [-126, -113]$

C. $b \in [-6, 2], c \in [-8, -3.8], \text{ and } d \in [5, 12]$

D. $b \in [12, 21], c \in [67.5, 70.9], \text{ and } d \in [115, 119]$

E. None of the above.

10. Describe the zero behavior of the zero $x = 2$ of the polynomial below.

$$f(x) = 8(x+2)^2(x-2)^7(x-4)^9(x+4)^{11}$$

A.

C.

B.

D.

E. None of the above.